

# Hank Cross, W1OOP -- Technical Innovator

By Scott Nacey, KK6IK

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Henry “Hank” Cross was a member of WARS throughout and 1960’s and later, I had the privilege to personally know him as a VHF contester on Mt Equinox in the late 1970’s where he supplied amazing “boat anchor” UHF and SHF equipment for the WARS June VHF contests. By that time, Hank always drove a massive white Chrysler – which at one point he drove off the side of the Mount Equinox road - by mistake, of course!

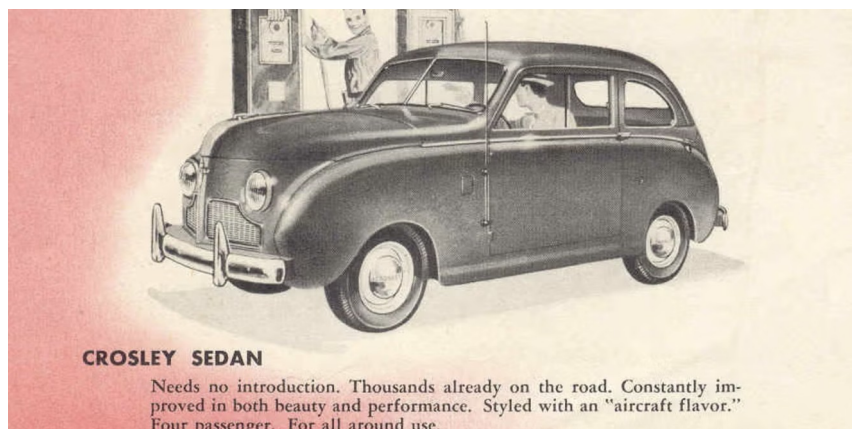


*Hank, W1OOP celebrating a contest victory with his 432 MHz array. Circa 1965  
source: [ok2kww.com/eme1960/eme1965eng.htm](http://ok2kww.com/eme1960/eme1965eng.htm)*

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VHF News profiled Hank, W1OOP, in its April 1950 issue, In a tone half admiring and half incredulous, the magazine described a man running transmitters on 50, 144, 220, and 420 MHz—sometimes all in one evening—and managing to wedge an astonishing amount of gear into a Crosley automobile – classic Hank. According to the article, his car-mounted 350-watt motor-generator powered a series of converters that covered everything from 3.9 MHz through the 420-MHz band.

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*1946 Crosley: Imagine stuffing 1940's ham gear into this!*  
source: 2020 Autoweek.com

## National Radio

After graduating from MIT, in 1950, Hank had begun work as a development engineer at the National Radio Company of Malden and Melrose, Massachusetts, a premier manufacturer of communications receivers, as well as, military and scientific equipment. Hank likely worked on the Commercial vs. Amateur side of National based on our best knowledge. As he described it “February 1st marked my first day as 9th assistant kibitzer, j.g.,” showing the dry humor that would color his later QST columns .



*A 1960-65 National AN/FFR-59 Naval Receiver, representative on Hank's National projects!*  
source: <https://www.radiomuseum.org/>

At National, Hank was surrounded by designers who were translating wartime radar know-how into consumer and laboratory receivers. It was a perfect match: Cross's day job sharpened the same instincts that fueled his late-night experimentation on the VHF frontier.

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## A Technical Author

Hank was a prolific writer. His first published technical article appeared in *QST* in October 1949, titled “A Cascode Converter for 144 Mc.” It was followed rapidly by “Using the BC-221 Frequency Meter at VHF” and “Adjusting Antenna Coupling in VHF Receivers” in early 1950. Each carried the hallmarks of his National Radio discipline: precise component values, straightforward alignment instructions, and a willingness to explain why the circuit behaved as it did.

Those articles came at a critical moment for amateur radio. The World War II surplus revolution had given hams access to cheap electronics and test-gear components, but few amateurs understood how to make those parts behave predictably. Cross did. His 1949-50 work effectively translated professional receiver engineering into the flourishing VHF home-brew world.

By the early 1950s, his name had become a familiar one in *QST*’s “Hints and Kinks” pages. While many contributors offered quick shortcuts, Cross’s entries were miniature lessons. His early *Hints* on tuning slugs, alignment techniques, and preventing oscillator drift all reflected the same measured, bench-tested confidence he carried from Melrose.

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## Engineer and Experimenter

In the decades after World War II, National Radio was a magnet for young engineers, many of them licensed amateurs. Cross was one of those who treated his workbench at home as an extension of the company lab. The *VHF News* profile even listed him among the Melrose crowd who could be heard nightly on 144 MHz AM with a booming signal, swapping notes on noise figures and antenna coupling.

National Radio’s own advertisements from that era—such as the July 1965 *73 Magazine* July 1965 issue listing its address at 37 Washington Street, Melrose—placed Cross right in the center of the region’s RF design scene. Whether in a National HRO-series chassis or a home-built converter, Hank’s circuits showed the same clean lines: stable oscillators, neutralized stages, and careful isolation.

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## Writing in the 1960s

By the early 1960s, the amateur world was shifting rapidly from vacuum tubes to transistors. In the October 1962 QST, Cross's "*Frequency Multiplication with Power Varactors at UHF*" demonstrated that the new solid-state devices were not just novelties but practical RF components .

He followed with "*No Tubes — Four Watts — Six Meters*" in December 1964, a landmark in the move toward compact solid-state VHF transmitters. Meanwhile, his *Hints and Kinks* submissions—"4X150 Screen Modulator/Regulator" and "*Transistor Speech Amplifier*"—showed how to hybridize old and new technologies.

Cross wrote as a builder to other builders: "Try this circuit—measure it—and if it doesn't behave, change it." The style reflected the same attitude his colleagues remembered decades later.

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## Microwave Associates

A firsthand recollection from George W1LSB, preserved in a correspondence with Dan W1DAN, adds an important chapter: both Sam Harris (W1FZJ) and Henry Cross (W1OOP) worked at Microwave Associates in Burlington, Massachusetts. George wrote, "*Sam had left by the time I started working there, but Henry was around for quite a while longer. He was an odd dude, but always good for an opinion.*"

## Sidebar: Who was Sam Harris, W1FZJ

[THIS TEXT SHOULD BE IN A SEPARATE BOX LOCATED NEARBY THE REFERENCE TO SAM HARRIS IN THE W1OOP ARTICLE.]

In the original records of early VHF and microwave radio, Sam Harris, W1FZJ (later W1BU), stands out as one of the bold experimenters who proved that amateur signals could reach far beyond the horizon. As documented in *The First Amateur Lunar Tests and Contacts 1953–1965*, Harris was a driving force behind his Rhododendron Swamp VHF Society’s pioneering 1296 MHz Earth–Moon–Earth experiments, working alongside Hank Cross, W1OOP, and other Massachusetts ham engineers to make the first amateur lunar reflections a reality . The *Who Was Sam Harris (W1FZJ/W1BU)* article and *WILSB* correspondence confirm his professional ties to Microwave Associates, where colleagues credited him as being “largely responsible for the parametric amplifier” that made those weak-signal feats possible . Later appearing in the Arecibo Observatory staff listings, Harris bridged the worlds of ham radio and scientific research with the same quiet determination that characterized his on-air presence —a builder, innovator, and New England original whose echoes still return from the moon. And who, but Sam, had a high power klystron in their shack back then?

Microwave Associates was one of the country's foremost microwave component houses—known for its work on parametric amplifiers, solid-state devices, and early gallium-arsenide components. In that setting, Cross found a natural continuation of his National Radio career: still hands-on, still designing, but now surrounded by colleagues who were stretching into the gigahertz range.

George W1LSB remembered him vividly from that period: *“He used to run an 829B on 2 meters from Needham Heights along with a BC-779 receiver and converter in front of it. Had a big signal at my QTH in Lawrence.”* That picture—Cross in his Needham Heights shack, combining a pre-war broadcast-era transmitting tube with a precision converter—captures the intersection of old and new that defined his approach.

The same correspondence notes that W1LSB met Cross again decades later at a **National Company reunion**, where Hank was remembered warmly by his former colleagues from both Melrose and Burlington. His move from National to Microwave Associates effectively mapped the evolution of New England's RF industry—from large-scale receiver production to precision microwave component systems design.

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## EME & Arecibo

Another piece of the puzzle appears in *The First Amateur Lunar Tests and Contacts 1953-1965*—a detailed historical account that names Hank Cross, W1OOP, among the experimenters involved in early Earth-Moon-Earth (EME) trials organized by the Rhododendron Swamp VHF Society. That group, including Sam Harris (W1FZJ/W1BU), operated near Wellesley and Needham and would go on to conduct groundbreaking 1296-MHz EME experiments.

The same report, corroborated by the *Who Was Sam Harris* file, shows Cross as part of a circle that blended professional microwave research with high-end amateur work. From those experiments grew Harris's later likely technical participation at the Arecibo Observatory in Puerto Rico—where Cross's name appears in notes recalling the period.

It is remarkable that a ham once profiled for a home-brew 2-meter converter in 1950 would, fifteen years later, be associated with one of the world's most powerful radio telescopes that required extremely low-noise receiving systems. Yet the continuity is obvious: the same disciplined curiosity that drove his *QST* articles drove the lunar-bounce experiments that defined the era.





*The Arecibo Observatory, one of Hank, W1OOP's projects – circa 1960's  
source: wikipedia.com*

### **Sidebar: The Rhododendron Swamp VHF Society**

[THIS TEXT SHOULD BE IN A SEPARATE BOX LOCATED NEARBY THE REFERENCE TO Rhododendron Swamp VHF Society IN THE W1OOP ARTICLE.]

Among the remarkable stories of the 1950's and 1960's is that of the Rhododendron Swamp VHF Society, a small circle of Massachusetts experimenters who, in the 1950s and early 1960s, pushed amateur radio to its highest frequencies and greatest distances. Operating from the wooded wetlands near Wellesley and Needham, the group—including Sam Harris, W1FZJ (W1BU), and Hank Cross, W1OOP—conducted pioneering Earth–Moon–Earth (EME) experiments on 1296 MHz, achieving some of the earliest verified amateur lunar reflections .

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## Ham Radio Magazine



*Ham Radio Magazine, August 1978 cover, Includes a W1OOP article!*  
*source: Ham Radio Magazine archive*

When *Ham Radio* magazine debuted in February 1968, by editor, Jim Fisk W1DTY and publisher T. H. Henney W1NLB, it quickly became the favored outlet for technically advanced amateurs. Hank's writing fit the magazines tone perfectly. The February 1969 issue carried his article "*Converting a Vacuum-Tube Receiver to Solid State (BC-348)*", a patient but extensive walk-through of a classic receiver modernization .

That was followed by a remarkable run of "Ham Notebook" columns throughout 1969: "*Dual-Voltage Power Supply*" (April), "*Transistors for VHF Transmitters*" (September), "*Solid-State Exciter for 432 MHz*" (October), and "*VFO Transistors*" (November) .

The breadth of those topics reveals a professional's grasp of the entire signal chain—from power regulation to RF generation—and they reflect the same themes found in Microwave Associates' own development labs. The *432-MHz Exciter* in particular echoed the microwave circuits then being refined for EME and repeater use in New England.

Each article combined narrative explanation with practical schematics, and readers appreciated his clarity. He made no claims of originality; he merely showed how to make things *work*.

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## Later Publications

The *ARRL Periodicals Archive* lists Cross's continuing output into the 1970s and 1980s: “*High-Speed Divide-by-N Counters*” (March 1976), “*Protection for Your Solid-State Devices*” (March 1981), “*The Hybrid Coupler*” (June 1982), and “*Low-Noise Preamplifiers with Good Impedance Match*” (November 1982) .

Looking solely at the verified documents, Hank's writing is prolific:

| Era                | Professional Base                    | Amateur Focus                                                    | Representative Publications                      |
|--------------------|--------------------------------------|------------------------------------------------------------------|--------------------------------------------------|
| Late 1940s – 1950s | National Radio Company (Melrose MA)  | VHF converters, receiver coupling, measurement                   | <i>QST</i> (1949 – 1950)                         |
| 1960 – 1965        | National Radio and independent work  | Varactors, solid-state RF, transistor transmitters               | <i>QST</i> (1962, 1964), <i>73 Magazine</i> 1965 |
| Mid-1960s – 1970s  | Microwave Associates (Burlington MA) | Transistor exciters, solid-state conversion, EME experimentation | <i>Ham Radio</i> (1969 series)                   |
| 1970s – 1980s      | Continuing microwave engineering     | Digital dividers, hybrid couplers, low-noise preamps             | <i>Ham Radio</i> (1976 – 1982)                   |

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## Great Contributions to Ham Radio

From 1949's cascade converter to 1982's hybrid coupler, Hank Cross's career forms an unbroken continuum through important amateur technology, much of it developed at his Birds Hill QTH in Needham. Few hams appeared as often in *QST* and *Ham Radio* while also holding key engineering roles at two leading RF firms. Even fewer bridged the amateur-professional divide so seamlessly.

Hank, W1OOP's contributions to ham radio were both prolific and substantial: more than thirty-three years of published work spanning *QST*, *Ham Radio*, and *VHF News*; employment at two of the region's key RF firms, National Radio Company and Microwave Associates; and participation in the pioneering EME and Arecibo collaborations that extended amateur signals literally to the moon.

Unknown to many of us in my High School bunch of Hams in the late 1970's, Hank was amazing and an part of the WARS Community!

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## The Final Note

In *QST July 2003*, the Silent Keys column included the simple line:

*"W1OOP, Henry H. Cross, Needham, MA."*

There was no accompanying biography or photograph—just a final acknowledgment that one of amateur radio's quiet builders had signed off.